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NOTE ON CRESCAS'S DEFINITION OF TIME

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IN *Or Adonai*, I, ii, 11, after refuting the Aristotelian definition of time reproduced in Maimonides' fifteenth Proposition, Crescas puts forward a new definition of his own. It reads as follows: **ולזה הגדר הנכון בוכן יראה שהוא שיעור התדבקות התנועה או המנוחה שבין שתי עתות**. The term **התדבקות** generally means 'continuity' and 'cohesion', and is contrasted with **התפרדות** or **התפרקות**, which mean 'discreteness' and 'disjunction', as, e. g., in the expressions **כמה מתדבקת** and **כמה מתפרדת** corresponding to the Greek *συνεχές* and *διωρισμένον* in *Categories*, IV. Taken in this sense, Crescas's definition of time would have to be translated as follows: '... the measure of the continuity of motion or of rest between any two instants'. To be sure, the expression 'the measure of the continuity of motion or of rest' is meaningless. But it could be explained with the help of a similar expression which occurs in Gersonides' discussion of Aristotle's definition of time (*Milhamot*, VI, i, 21). Among the several tentative interpretations of Aristotle's definition discussed by Gersonides, there is one which but for the absence of the expression 'or of rest' is like that proposed here by Crescas. It reads somewhat as follows: Time is the measure of motion between two instants. **אם שנאמר שהזמן אשר ישער התנועה הוא מה שבין העתות אשר יחלקו התנועה, וזה אמנם יהיה כשיהיה משער התנועה אשר בין העתות ההם**. Now, previous to his statement of this defini-

tion, Gersonides refers to the portion of time included between two instants as a 'continuous quantity' bounded by instants. והוא מבואר שהעתה ימצא לו שני צדדים מהמציאות: האחד... והאחר, הוא הגבלת הכמות המתדבק, והוא הגבלת החלק האחד מהזמן. Accordingly, the expression 'the measure of the continuity of motion' in Crescas's definition could be taken to mean 'the measure of the continuous quantity of motion', the term הכמות המתדבק being equivalent to התנועה של התנועה. Crescas's definition of motion, therefore, with the exception of the expression 'or of rest' would thus be identical with one of the tentative definitions discarded by Gersonides. It is somewhat in this sense, in fact, that the definition is taken by Eisler in his *Vorlesungen über die jüdischen Philosophen des Mittelalters*, 3, p. 144. 'Die Zeitdauer wird an der Ruhe oder an der Bewegung zwischen zwei Zeiten gemessen; die Zeit ist also das Mass für die continuirlichen Quantitäten, wie die Zahl für nicht zusammenhängende Quantitäten.'

This interpretation of the definition, however, involves some difficulties. Were this its meaning, it is strange that Crescas should take no notice of the objections raised by Gersonides against this definition. Furthermore, if that were the meaning of Crescas's definition, he has failed to prove his main point, namely, the absolute separation of time from motion. His addition of the terms 'or of rest' in the definition does not achieve that purpose, for rest is merely the negation of motion—an objection which, despite Crescas's attempt to explain it, is insisted upon, as we shall see, by one of his critics.

It is therefore necessary that the term התדבקות be rendered here not by 'continuity', but by 'continuance', or rather 'duration'. The definition thus translated assumes

an entirely new meaning, the significance of which I shall point out after a brief discussion of its origin. It can be shown that the term התרבוּקוֹת was known to Crescas to have the two meanings of 'cohesion' and 'duration'. Thus in *Or Adonai*, I, i, 13, he suggests that the term מתרבק in Maimonides' thirteenth Proposition should be taken not in its ordinary sense of 'cohesion', but in the sense of 'eternal duration'.¹ או שרצה באמרו מתרבק, תמיד נצחי. Its corresponding Greek term *συνέχεια* likewise has these two meanings. Aristotle uses it in both of these meanings in one passage in the *Physics*, VIII, vii, § 3 (260 b, 20–21). In the Hebrew translations of the *Physics*, *συνεχῶς* in this passage is in one case rendered by נצחית and in another case by מתרבקת.

The definition of time in terms of the duration of motion is not original with Crescas. It has a long history behind it. It was of common usage in post-Aristotelian philosophy among the Stoics and the Neoplatonists, the latter of whom tried to identify it with an ancient view of some of the Pythagoreans. Its traces are also found in the works of many Arabic and Hebrew authors with which Crescas was familiar. Crescas saw clear through the difference between the Aristotelian and the later definitions of time, and has utilized it here for his own purpose. It is due to the unoriginality of his definition, and to his reliance upon the general acquaintance of his contemporaries with the nature of that definition, that Crescas did not think it necessary to enter into an elaborate explanation of its meaning.

¹ This is the correct reading of the passage according to the Vienna, Parma, Munich, Oxford, and Vatican MSS. The Ferrara edition as well as the Paris and Jews' College MSS. read או שרצה באמרו מתרבק, מתרבק תמיד נצחי.

The clearest statement of the definition of time in terms of duration is found in Plotinus. In the *Enneads*, III, 7, 6, he says that among those who define time as a relation of motion, some identify it with *διάστημα*, i. e. the interval or extension of motion. What is meant by that *διάστημα* he does not explain. The Latin translation, however, adds the gloss 'sive spatium, sive durationem'. This gloss is probably based upon the subsequent discussion of the term *διάστημα* by Plotinus himself. In chapter 7 he raises the question what that *διάστημα* might mean, in answer to which he mentions *ποσόνδε*, i. e. quantity, and hence space and *συνέχεια*, i. e. duration.

Plotinus does not mention the name of the author of the un-Aristotelian definition of time. But we gather this information from Simplicius. In one place in his Commentary on the *Categories*, Simplicius informs us that it is Zeno who defines time as the *διάστημα* of motion (cf. Zeller, *Stoics, Epicureans and Sceptics*, ch. VIII, Eng. Tr., p. 197, note 2). In another place, in his Commentary on the *Physics* (cf. Simplicius, *In Aristotelis Physicorum libros commentaria*, ed. Diels, p. 786, l. 11 sqq.; and Taylor's translation of the *Physics*, p. 544). Simplicius mentions the fact that Jamblichus in the first book of his Commentary on the *Categories* quotes Archytas to the effect that 'time . . . is a certain number of motion, or the universal extension of the nature of the universe'. A little further in the same passage Simplicius mentions Damascius as the one who interpreted the term 'extension' used by Archytas to mean 'temporal extension', or 'duration'. To quote Simplicius: 'Time is the universal extension of the nature of the universe, because it is not only the extension of motion, but also of rest. . . . And as he proceeds, he

renders it still clearer, that he does not define extension according to magnitude [i.e. space] but according to the duration of the ever'. Cf. *op. cit.*, p. 787, ll. 33-4, and p. 788, ll. 18-20 καθόλου δὲ διάστημα τῆς τοῦ παντὸς φύσεως, ὅτι οὐ μόνης κινήσεως ἀλλὰ καὶ ἡρεμίας . . . καὶ προελθὼν ἔτι σαφέστερον ἐποίησεν, ὅτι οὐ κατὰ μέγεθος ὥρισε τὸ διάστημα, ἀλλὰ κατὰ τὴν τοῦ αἰὲ συνέχειαν.

Traces of this definition of time are to be found in the works of Arabic authors. In the Encyclopedia of the Brethren of Purity, we find the following statement: 'Time is also said to be the number (عدد) of the movements of the celestial sphere. Or, again, it is said to be a kind of duration (مدّة) which becomes numerically determined by the movement of the celestial sphere'.

وقد قيل انه عدد حركات الفلك وقد قيل انه مدّة تعدّها حركات الفلك.
(Cf. Dieterici, *Die Abhandlungen der Ichwân Es-Safâ*, Arabic text, p. 35; German translation, pp. 14-15 of Book V of his series *Die Philosophie der Araber*, &c.). Of these two definitions, it is clear, the first represents the Aristotelian, or rather the Platonic, view, the second the un-Aristotelian.

The un-Aristotelian definition seems to be implied in Avicenna's discussion of time in his *Al-Najat* (Rome, 1593, pp. 30-31) and also in his *Eṣ-Sefâ*, as may be gathered from Horten's translation of the latter work (cf. Horten, *Die Metaphysik Avicennas*, IV, iii, ch. 4, § 2). The term used by Avicenna in the sense of 'duration' is الاتّصال.

Following Avicenna, Algazali reproduces a similar definition in his *Makasid al-Falasifah*, *Metaphysics*, IV. He says, 'Time is a term signifying the duration of motion, that is to say, the extension of motion'.

اذ الزمان عبارة عن مدّة الحركة اى عن امتداد الحركة.

(From a copy of MS. Berl. Quet., No. 59 in the possession of Professor Henry Malter.)

The terms 'duration' and 'extension' are differently rendered in the two Hebrew translations which I have consulted. In one (MS. Cambridge University Library, Mm. 8. 24), 'duration', מַדָּה, is rendered by its Hebrew homophonous term מִדָּת, and 'extension', אִמְתָּד, by התפשטות. (כי הזמן רמז למדת התנועה ר"ל התפשטות התנועה). In the other (MS. *ibid.*, Mm. 6. 30), מַדָּה is rendered by עַת and אִמְתָּד by (כי הזמן מליצה מעת התנועה ר"ל מהמשך התנועה) המשך.

The same definition is also reproduced by Sharastani, evidently from the *Al-Najat*, in his summary of Avicenna's philosophy (Cureton's edition, p. 401). 'And so there is here a measure for motions, corresponding to them, and everything corresponding to motions is something having duration, which duration implies a continual renewal of itself. It is this that we call time.'

فَاذَا هَاهُنَا مِقْدَارٌ لِلْحَرَكَاتِ مُطَابِقٌ لَهَا وَكُلُّ مَا طَابَقَ لِلْحَرَكَاتِ فَهُوَ مُتَمِّصٌ
وَيَقْتَضِي الْإِتِّصَالَ مُتَجَدِّدَهُ وَهُوَ الَّذِي نَسَمِّيهِ الزَّمَانَ.

The term used by Sharastani, which I have translated by 'duration', is الإِتِّصَالَ, a word which, like the Hebrew התרבויות, used in Crescas's definition, is derived from a root meaning 'to join', 'to cohere', and again, like the Hebrew התרבויות, ordinarily means 'cohesion' or 'continuity'. But in the light of Avicenna's definition of time which is reproduced by Algazali, and by analogy of the Greek *συνέχεια* and the Hebrew התרבויות, I have taken this term here in the sense of 'duration'. Haarbrücker, who translated Sharastani into German, seems to have missed this peculiar meaning of the term and its significance in the definition of time. He consequently takes the term الإِتِّصَالَ in its ordinary sense

of 'cohesion' (*Zusammenhang*), and thus attributes to Sharastani a definition of time as meaningless as would be that of Crescas, if we were to translate the term *התרבקות* in his definition by 'cohesion'.

This un-Aristotelian definition of time occurs also in the works of the early Jewish philosophers. Saadia defines time as being 'nothing but the measure (or extension) of the duration of bodies' (cf. *Emunot*, II, 11, *وكان الزمان اتّما هو*, *مدّة بقاء الأجسام*, which in Judah Ibn Tibbon's Hebrew translation reads *הזמן איננו כי אם מדת קיום הנשמים*). The essentially characteristic word in this definition is the term 'duration', for in another place in his work Saadia uses only that term in his definition of time. (Cf. *Emunot*, I, 4, 'Its essence, truly defined, is the duration of these existent objects, &c.' *... وإتّما حقيقة بقاء هذه الموجودات* . . . In this case Judah Ibn Tibbon translates the term *بقاء* by *השארות* and not by *קיום*. *... אבל אמתתו השארות הנמצאות האלה* . . . Now this definition of time is evidently not Aristotelian, as has already been pointed out by Guttman (cf. *Die Religionsphilosophie des Saadia*, p. 80), for it lacks the most characteristic expression used in Aristotle's definition of time, namely, its being the number or measure of motion. But Guttman, as we shall see, is wide of the mark in identifying Saadia's definition as Platonic. He has been led into this error by a superficial reading of a certain passage of Zeller, which he mistook to be an exact reproduction of Plato's definition of time and in which the term 'Dauer' would seem to be the most characteristic feature. (Cf. Zeller, *Phil. d. Gr.*, 2, 1, p. 521, 'Aus diesen Bewegungen der Himmelskörper entspringt die Zeit, welche nichts anderes ist, als die Dauer ihrer Umläufe'.) Plato, however, has never given a clean-cut definition of time in which the term 'duration', *διάρτημα*

or *συνέχεια*, forms the most important part. It is only from his discussion in the *Timaeus* (37-9) and from the doubtful reference to it in the *Physics* (IV, x, § 7) that we may gather some idea of Plato's conception of time, and from both these sources it appears that the most characteristic feature of his conception of time is its connexion with the movements of the celestial spheres. As to the nature of this connexion, however, it is a matter of controversy among the Greek commentators whether Plato, like Aristotle, considered time to be the measure of the motion of the spheres, or, unlike him, he identified it with the motion itself. (Cf. Simplicius, *op. cit.*, pp. 700-4, and Taylor's translation of the *Physics*, pp. 242-5, n. 4.) It is therefore more reasonable to assume that Saadia follows that un-Aristotelian definition of time which, as we have seen, is characterized by the use of the term 'duration'.

Saadia's definition seems to have been adopted verbally by Abraham bar Ḥiyya. He defines time as *ושאינו כי אם* [ממדת] *אמירה* [בב"י אמירת] *מעמדת הנמצאות* (cf. *Hegyon ha-Nefesh*, p. 2 a, Leipzig, 1860). By changing the dubious reading of [ממדת] *אמירה* [בב"י אמירת] to *מדת* we have a literal Hebrew translation of Saadia's definition of time, in which the term *زمان* is rendered by *עמדה*. Thus Abraham bar Ḥiyya's definition of time cannot be either Aristotelian or Platonic, contrary to a statement of Husik, according to whom time is defined by Abraham bar Ḥiyya as the measure of motion (cf. *A History of Mediaeval Jewish Philosophy*, p. 115).

We have thus seen that the essential part in the un-Aristotelian definition of time is the term 'extension', in the sense of temporal extension, or 'duration'. In Greek the words used are *διάστημα* and *συνέχεια*. In Arabic for temporal 'extension' Algazali uses *امتداد*, which is translated

into Hebrew by *המשך* and *התפשטות*. For 'duration' we have the following terms: (1) *שָׁא*, used by Saadia, and translated into Hebrew by *השארות* and *קיום* (Judah Ibn Tibbon) or by *עמדה* (Abraham bar Ḥiyya). (2) *مدّة*, used in the Encyclopedia of the Brethren of Purity and by Algazali, and rendered into Hebrew by *מדה* and *עת*. (3) *الاتصال*, used by Sharastani and Avicenna, which is the exact equivalent of the Greek *συνέχεια*. The Hebrew for this is *התרחקות*, and it is this term which is used here by Crescas. In all these definitions of time, as we have seen, the term 'duration' is used either together with the term 'motion' (Plotinus, Arabic authors), or without it (Archytas, Saadia, Abraham bar Ḥiyya). The term 'motion', therefore, is not an essential part of this un-Aristotelian definition. If it is used at all, it is used for some other reason, and not necessarily to the exclusion of 'rest', as will be presently explained. Thus Crescas significantly says in his definition of time that it is the measure of the duration of *motion or of rest* (cf. Simplicius's citation from Damascius quoted above).

Let us now see what the significance of this un-Aristotelian definition is, and how it differs from the Aristotelian definition.

To begin with, these two definitions imply two fundamentally different conceptions with regard to the problem of the reality of time. Aristotle himself, as is well known, raised the question as to the reality of time. His own view on this point amounts to a compromise. Time is partly real and partly ideal. In so far as it is conceived only in connexion with motion it is real, for motion implies the existence of a moving object and a space medium. But in so far as time is not identical with motion, it being

only the measure or number of motion, it is conceptual, for the act of measuring or numbering is mental (cf. *Physics*, IV, xv). The implication of the un-Aristotelian definition, on the other hand, is that time is purely ideal. We thus find that Crescas, after having stated this definition of time, derives from it the logical conclusion, as follows: 'Consequently it may be inferred that the existence of time is only in the soul' ולזה יראה היות מציאות הזמן בנפש. According to this view time is absolutely independent of motion, magnitude, and space. It could have been conceived by the mind even had there been no external world in existence. We thus again find Crescas contending, as a consequence of his definition of time, that the statement of R. Judah bar R. Simon that the order of time had existed previous to creation (*Bereshit Rabba*, ch. III) should be taken in its literal sense. ולזה יתאמת מאמר ר' יהודה בר רבי סימון בפשוטו והוא מלמד שהיה סדר זמנים קודם לכן (cf. *Moreh*, II, xxx).

But time, in its purely ideal nature, when conceived absolutely apart from motion, is indeterminate and immeasurable. It is an unqualified limitless duration. It does not become a subject of measurement unless it is conceived in connexion with an external moving object. For the existence of an object in motion implies three things: (1) a corporeal magnitude, which is the subject of motion; (2) space, which is the medium of motion and within which one may distinguish the different distances traversed by the subject; (3) the process of motion itself, which is subject to a variation of velocity. And thus when there is an object in motion we are able to obtain a definite portion of time by dividing the distance by the velocity. This does not mean that motion will give

rise to time; it only means that through motion we are enabled to get a part of definite time out of the indefinite duration which has an independent conceptual existence of its own. Time appears to us in its definite proportions only in the ratio of distance and velocity (cf. Sharastani and Algazali, *op. cit.*; and Altabrizi's commentary on Maimonides' Twenty-five Propositions, Prop. XV). Hence Crescas's definition that time is the measure of the duration of motion or rest between two instants.

This difference between the two definitions may be further stated in the terms of the mediaeval scholastic discussion whether time was materially or only formally different from motion (cf. Suarez, *Metaphysicarum Disputationum*, ed. 1614, part II, p. 472 b 'An tempus in re distinguatur a motu'; cf. also *Annotationes* to Duns Scotus's *Quaestiones in Libros Physicorum Aristotelis*, Quaestio XV, ed. Vivès, p. 125. According to Aristotle's definition time is only formally different from motion; materially they are both identical. Or, to put it in the language of Simplicius and Averroes, time and motion are according to Aristotle the same in subject ($\psi\pi\omicron\kappa\epsilon\iota\mu\acute{\epsilon}\nu\omega$ = בננו) but different in definition ($\lambda\omicron\gamma\omega$ = במאזר). Cf. Simplicius, *op. cit.* IV, 11, p. 712, ll. 18-19 $\alpha\lambda\lambda\acute{\alpha} \kappa\alpha\acute{\nu} \tau\hat{\omega} \psi\pi\omicron\kappa\epsilon\iota\mu\acute{\epsilon}\nu\omega \tau\acute{\alpha}\upsilon\tau\acute{\alpha} \hat{\eta}, \tau\hat{\omega} \lambda\omicron\gamma\omega \delta\iota\alpha\phi\acute{\epsilon}\rho\epsilon\iota$. Just as five things are in their subject wood, but they are five according to number, so are time and motion. Their common subject is the moving object. When we view this object with reference to its motion between co-subsistent prior and posterior points in space we get pure motion. But when we view it with reference to successive prior and posterior points which are not in space, we get time. According to the definition adopted by Crescas, on the other hand, time and motion are

materially different. In order to exist, time, unlike motion, does not imply the existence of an object in space. Its existence is purely conceptual. In order to be measured, however, this requires the existence of an object moving in space; for definite time is obtained by the division of distance by velocity.

That these two definitions revolve, as I have been trying to show, about the problem of the reality of time, is clearly brought out in two passages of Algazali and Averroes. As we have already seen, Algazali defines time in terms of 'duration'. Averroes, of course, follows Aristotle. Now, in his *Hapalat ha-Pilusuphim*, I, Algazali makes the following statement: 'Passing by itself is time; passing on account of something else is motion, for motion passes by virtue of the passing of time.' העובר בעצמותו הוא הזמן, והעובר בזולתו הוא התנועה, כי הוא תעבור בעבור הזמן. To this Averroes replies in his *Hapalat ha-Hapalah*, I, as follows: 'What he says is true enough, and, indeed, it proves the truth of what we have said about the nature of time. Certain it is, however, that the 'before' and the 'after' of time include at once their respective parts of motion as well as their respective parts of duration, not merely their respective parts of duration. This is in opposition to Algazali' (quoted in Narboni's Commentary on Algazali's *Karwanot*, Metaphysics, IV, (MS. Paris, Bibl. Nationale, Cod. Heb. 901):

ואמר בן רשד בהפלת ההפלה, כי זה שאמרו מבואר בעצמו, וזה באמת מעיד על אמתת מה שבארנוהו. ואמנם הקודם והמתאחר מן הזמן יכללו באמת חלקי התנועה עם חלקי ההמשך יחד, לא חלקי ההמשך לבד. וזה בחלוף אבוהאמר.

The point at issue between Algazali and Averroes is clear. To the former, time is abstract duration, materially

differing from motion. Hence it is ideal. To the latter, time is materially identical with motion. It is therefore in so far real. In another passage, quoted by Narboni in his Commentary on the *Moreh*, Part II, Proposition XV, Averroes makes his point still clearer. He says that while time must always involve motion, pure duration, conceived without motion may be termed 'eternity':

ואמר בן רשד, זה לשונו: הזמן מליצה מהמשך מציאות למציאות המתנועעות, ולכן לא יצויר הזמן אלא עם התנועה, והנצח, הוא דהר בערב, מליצה מהמשך מציאות הנמצאות הבלתי מתנועעות, ולכן יאמר באלו שאינם בזמן, וירצה אמנם כי הזמן לקוח מצד בחינת נושא ההמשך שהוא התנועה, ובכלל התנועה, מצד שהיא נלקחת, והמישכה; כי הוא המשך התנועה אשר במתנועע הראשון, הכולל לכל הנמצאות המתנועעות ומשתנות בו, בשנוי המוקף במקוץ, כי אנחנו משתנים מפני שאנחנו במציאות משתנה, והנצח לקוח מצד בחינת המשך מציאות מופשט, והוא דמות זמן, לא אמתת זמן. כי אין ספק שהנבדלים נמצאים תמיד ונמשך מציאותם, אך לא יתואר בזמן, כי אין מטבע התנועה אשר הזמן נמשך לה, ואין בזמן מציאותם, אחר שהזמן הוא בהיותם השמים אשר מציאותם בם. 'Said Averroes, and we quote him verbatim: "Time is an appellative term for the duration of the existence of such objects as have motion. Consequently time cannot be conceived but in connexion with motion. Eternity—*dahr* in Arabic—is an appellation for the duration of things that are immovable. Hence immovable beings are said to have no existence in time." By this he means to say that time is to be taken with reference to the *subject of duration*, which is *motion*, and that it must be implicated in that motion, with reference to which it is taken, and the duration thereof—for time is the duration of the motion of the first movable [sphere] which comprehends all other objects and through which all those objects are moved and changed in the same manner as an object enclosed within another object is said to change through the change of

the object enclosing, for we do all change because we exist within something changing. Eternity, however, is to be taken with reference to *abstract duration*. It has the semblance of time, but is not real time. Thus while there can be no doubt that the immaterial intelligences continue for ever and have duration, they cannot have the predication of time, inasmuch as their nature precludes motion with which time must be related. Their existence therefore is not in time, since to be in time means to partake in the motion of the heavens in which things have their existence.' (Cf. also De Boer, *Die Widersprüche der Philosophie nach al-Gazzali*, pp. 23-5.)

The same contrast between the Aristotelian and un-Aristotelian definition of time is again brought out by Narboni in his Commentary on the *Kawanot*, Metaphysics, IV, where he compares Avicenna's and Algazali's views with that of Averroes:

אמנם אבותאמר ואבן סינא לא לקחו המספר אשר אמרו אריסטו מקום מספר חלקי התנועה, אבל מספר חלקי המשך אשר לשלמות הראשון, ולזה אמר ששרש המשכות שרש הזמן, ר"ל, סוגי מבלי הכנס הנשוא בו, וזה להבדל טבע הזמן מטבע התנועה במאמר, ר"ל, בנדר, ר"ל מצד חלופו בנושא נ"ב, אם הוא נמשך לו, אבל לא שיכנס בו. וזה בחלוקה בין רשר. כי בן רשר מודה, כי המשך והתפשטות מציאות התנועה היומית הוא אמתת הזמן, רק כי הוא יחשוב שהוא צורת הזמן לא כללות זמן, וזה כי לפי שבן רשר, הזמן כמו שאמרנו הוא שיעור התנועה . . .

'Algazali and Avicenna, however, do not take the term "number" used by Aristotle in the sense of the number of the parts of motion, but as the number of duration which is of the nature of a primary entelechy. He thus says that the essence of duration is the essence of time, that is to say, they have a generic identity without implying a common

subject [i.e. motion]; and this follows as a consequence from the view that the nature of time differs from that of motion in expression, i.e. in definition, as well as in subject. Though motion bears some relation to time, it is not part of it. This is in contradistinction to Averroes's view. For while Averroes admits that the duration and extension of the diurnal motion [of the sphere] is the essence of time, he considers that to be only the form of time but not the whole of it [i.e. they are related in form, not in substance]. According to Averroes, as we have pointed out, time is the measure of motion, &c.'

In adopting this un-Aristotelian definition of time Crescas has therefore attained his main purpose, namely, the absolute separation of time from motion. The main characteristic of this definition, as has been shown, is the identification of time with pure duration. Motion comes in only as a means of measuring off a definite part of time, and for this rest may do as well as motion. The full significance of this definition has not always been fully understood. Isaac Ibn Shem-tob (fifteenth century), who like his nephew Shem-tob ben Joseph Ibn Shem-tob, the well-known commentator on the *Moreh*, makes several disparaging remarks about Crescas in his supercommentary on Averroes's *Intermediate Physics*, missed the main point of this definition. Taking Crescas's definition to differ from that of Aristotle only in the addition of the term 'rest', he argues as follows: Since rest is only the negation of motion, by defining time in terms of rest, it still logically implies the existence of motion. Isaac Ibn Shem-tob does not explicitly mention the name of Crescas in this particular instance. He refers to him only as a 'certain scholar from among the philosophers'. It is clear, however, that he

refers there to Crescas, whom he names and criticizes in other parts of the same work :

ועוד יש למספק שיאמר שאחר שאריסטוטלס אומר בפרק הבא
אחר זה שהזמן משער למנוחה בציורו לתנועה השוה לה, למה זה ועל
מה זה לא אמר בגדרו אריסטו מספר התנועה והמנוחה ונאמר
בהתרת הספק הב"ה, שכבר בארנו בהתרת הספק שעבר שאינו נמצא
אמתת זמן במנוחה [. . . "זמן הוא קנין ומנוחה הוא העדר ויהיה
א"כ העדר הקנין משער להעדר באמצעות ציורנו דבר נמצא"] ואחר
שוה כן א"א שנאמר שיהיה ראוי שתלקח המנוחה בגדר הזמן כמו שכבר
חשב חכם אחד מן החוקרים בזה המקום.²

The discussion of time in Arabic and Jewish philosophic literature, as here outlined, may prove to be of some historical significance. In it we already find all the problems about the nature of time that are discussed at length by the later Scholastics—the problem as to the definition of time, whether it should be in terms of motion or in terms of pure succession, as to its reality, and as to the nature of its distinction from motion. We have seen how all these problems are interdependent. It is interesting to note that the Scholastics have not always seen this interdependence of the problems. Furthermore, Crescas's definition of time and its historical background may throw light upon Spinoza's discussion of the same problem. Spinoza, as is well known, distinguishes between time and

² From an unpublished work in the Cambridge University Library, Mm. 6. 25. This work I have found to be identical with the anonymous commentary on Averroes's *Intermediate Physics* in Munich, Cod. Heb. 45. Steinschneider ascribed the latter work to Isaac Albalag (*Uebersetzungen*, § 49), which can be disproved independently by internal evidence. In connexion with Isaac Ibn Shem-tob I may also state that I have proofs which conclusively show that he is the author of the three commentaries on the *Physics* found in Trinity College, Cambridge, R. 8. 19, which are described by both Schiller-Szinessy and Steinschneider as anonymous (cf. *Uebersetzungen*, § 52 c).

'duration'. Duration is indefinite time. Time is only one of the 'modes of thinking, or rather of imagining' (*cogitandi, seu potius imaginandi, modos*), to measure off a definite portion of time (cf. *Epistola*, XII, *olim* XXIX). Without misprizing the originality of Spinoza's conception of time and eternity as a whole, it can be shown that he is freely operating with terms and ideas of long standing in the Jewish philosophic literature. To students of Bergson, too, it may perhaps be of some interest to compare his distinction between 'pure duration' and 'mixed time' with the implications of the two contrasting definitions of time which we have discussed.